FIG. 1

PRIOR ART

A–B–C :WELDING PATH
β :REFERENCE PATH
θ :INCLINATION ANGLE
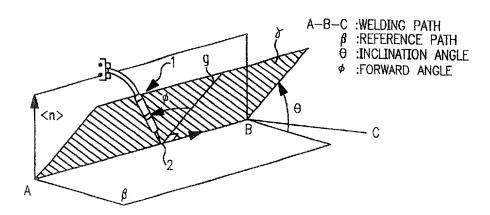ϕ :FORWARD ANGLE

FIG. 3

FIG. 2A

TEACH ROUGHLY BY JOG FEED ONLY POSITIONS A,B...F
WITHOUT PAYING ATTENTION TO THE ORIENTATION

⇩

FIG. 2B

⇩

REFERENCE PLANE
INCLINATION ANGLE
FORWARD ANGLE
→ INPUT →
WELDING ORIENTATION
AUTOMATIC CALCULATION

⇩

FIG. 2C

⇩

NUMBER OF ADDED
POINTS
INTERVAL
→ INPUT →
AUTOMATIC CALCULATION FOR SMOOTH
ORIENTATION CHANGE

⇩

⇩

ARC WELDING EXECUTION

θ :INCLINATION ANGLE
φ :FORWARD ANGLE

FIG. 4

β :REFERENCE PLANE
<n> :NORMAL VECTOR OF REFERENCE PLANE
A-B :WELDING PLANE

FIG. 5

```
UTILITY/TORCH ORIENTATION/TRANSFORMATION//////////AXIS////50%/
PROGRAM                                    PAGE 1/4      5/7


  1 TRANSFORMATION SOURCE PROGRAM:     [TEST]
  2      SCOPE:                                       PART
  3      START ROW:                                   34
  4      END ROW:                                     38
  5 PRODUCED/REPLACED:                            /REPLACED/
  6 PROGRAM DESTINED TO BE TRANSFORMED: (UNUSED)  [* * * * * *]
  7      INSERTION ROW:          (UNUSED)          * * * * *



PAGE IS CHANGED BY SHIFT + DOWN,SHIFT + UP
  [SCREEN]
                                                  >
```
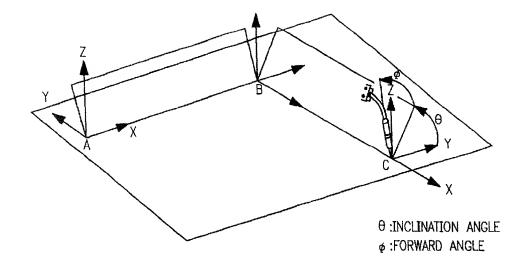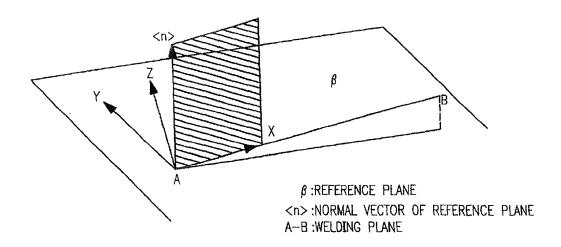
FIG. 6

```
UTILITY/TORCH ORIENTATION/TRANSFORMATION//////////AXIS////50%/
DIRECT INPUTTING TORCH ORIENTATION        PAGE 3/4      2/6

  1 REFERENCE PLANE TEACHING:              YES
  2            P1:              /TEACHING EXECUTED /
  3            P2:               TEACHING EXECUTED
  4            P3:               TEACHING EXECUTED
  5 INCLINATED ANGLE:               . 00 deg
  6 FORWARD ANGLE:                  . 00 deg



PAGE IS CHANGED BY SHIFT + DOWN,SHIFT + UP
  [SCREEN]   TRANSFORMATION REFER TO POSITION STORE POSITION>
```

FIG. 7

UTILITY/TORCH ORIENTATION/TRANSFORMATION/////////AXIS////50%/
POSITION INSERTION   PAGE 4/4   2/6

    1 NO. OF POSITIONS :   /2/
    2 PITCH LENGTH :   3.00mm

PAGE IS CHANGED BY SHIFT + DOWN,SHIFT + UP
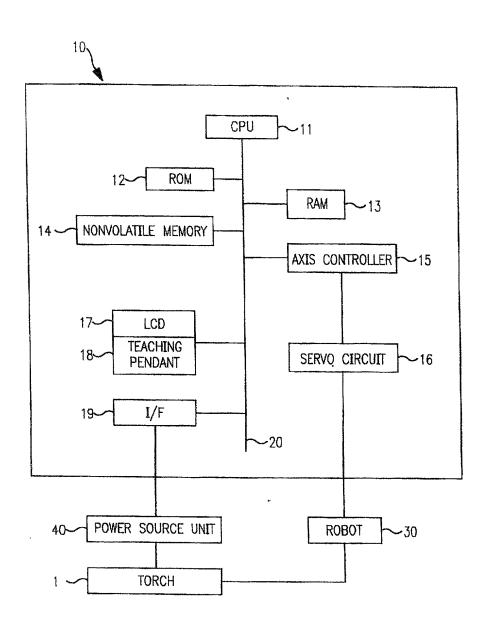   [SCREEN]   EXECUTION   >

FIG. 8

10

CPU — 11

12 — ROM

RAM — 13

14 — NONVOLATILE MEMORY

AXIS CONTROLLER — 15

17 — LCD

18 — TEACHING
PENDANT

SERVO CIRCUIT — 16

19 — I/F

20

40 — POWER SOURCE UNIT

ROBOT — 30

1 — TORCH

FIG. 9

A ✕━━ B
                                    a   b   (c)
                                   PITCH PITCH PITCH
                                                  d
                                                 PITCH
                                                  e
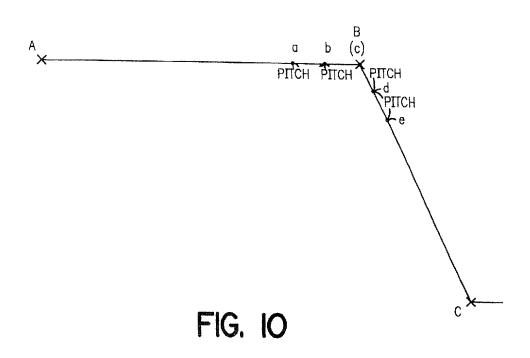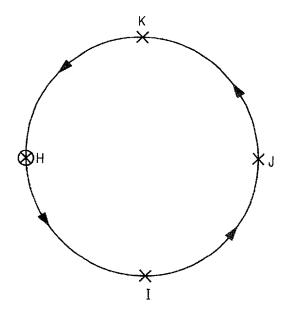
                                                              C ✕

FIG. 10

                    K
                    ✕

        ⊗H   ✕J

                    ✕
                    I

FIG. 11

START

INPUT NAME OF TRANSFORMATION SOURCE PROGRAM — S1

SPECIFY TRANSFORMATION SCOPE
(SELECT/SET WHETHER WHOLE OR PART PROGRAM) — S2

PART OF PROGRAM SELECTED? — S3
N
Y

SPECIFY TRANSFORMATION START ROW — S4

SPECIFY TRANSFORMATION END ROW — S5

SELECT/SET WHETHER PRODUCED OR REPLACED — S6

PRODUCTION   SELECTED? — S7
N
Y

INPUT NAME OF PROGRAM DESTINED TO BE
TRANSFORMED — S8

REFERENCE PLANE TEACHING? — S9
N
Y

TEACH REFERENCE PLANE — S10

INPUT INCLINATION ANGLE θ — S11

INPUT FORWARD ANGLE ϕ — S12

END

PROGRAM PRODUCTION — S17

S13 — CORNER PART IS PRESENT?
N
Y

SET n — S14

SET PITCH — S15

PROCESSING OF AUTOMATIC CALCULATION
FOR SMOOTH ORIENTATION CHANGE — S16

FIG. 12